THE

VETERINARY JOURNAL

NOVEMBER, 1939

Editorial

THE PIG INDUSTRY

THE pig is one of the most prolific breeding animals of the farm. He comes to commercial maturity, whether for pork or for bacon, within a relatively short period. He does not require an extensive farm acreage, indeed his entire life may be spent within the bounds of a very few square yards. He can be reared equally well on the large farm, the small holding or even at the labourer's cottage. Being an omnivorous and not a very selective feeder his food may vary according to the circumstances that prevail and although it is true that the best pigs are grown on the best food it is possible to produce reasonably good pork or bacon by using food which would otherwise be wasted.

Taking all these circumstances into consideration it will be recognised that the pig and his products are a most valuable asset to the food supply of a country. For many years we have not produced in this country a sufficiency of pigs to meet our needs. There are many reasons for this state of affairs. One potent factor in the past has been the variability in price return of the finished product. The home pig market showed periods of prosperity when prices were good and periods of despondency when things were bad. In the price depression periods breeders often lost money, in the good periods they probably made enhanced profits. This led to what might be called an in and out trade; breeders would try to get in when prices were high and get out when they were low. The more astute probably prospered, the majority missed the market often with disastrous results. Those who kept going all the time, good or bad, were able to make an average profit but many had not the courage to stick to their pigs.

During the latter part of the last century the Danes developed their pig industry in conjunction with the dairy produce system and their project has been eminently successful if we can judge by figures. In 1881 the pig stock in Denmark was 527,000; in 1931, i.e., in 50 years, it had increased to 5,453,000. By co-operation between the Government and farmers and also by co-operative effort in the establishment of bacon factories this gigantic industry has been evolved. Improved methods of breeding, housing and feeding have been adopted leading to a better finished product and also to one which has been constant in quality and so more acceptable to the consumer. Export trade has been encouraged and it has grown apace, although the Danes were at first faced with the problem of supplying their three main markets, i.e., England, Germany, and Denmark, with a different kind or type of pigs. The difficulties were eventually overcome by the concentration on the production of a bacon pig for England and arrangements being made for the export of living animals to Germany.

In the space of 50 years, during which period Denmark has developed her agricultural life to an extraordinary degree, the pig industry of Denmark has become one of their most important industries. Why has England lagged behind? Surely if one country can develop such an industry it must not be beyond the powers of another at any rate to supply the needs of its own people.

Probably the basic cause is that in this country we do not like to be regimented and as a result things have been left to develop by individual effort and in a somewhat haphazard way. There is much to be said in favour of individual effort and as a criterion of this we can point to such bacon factories as we possess as being second to none in efficiency. Individual effort, however, has led to variability of product and although the best English bacon is in the first grade class, the consumer can never be certain that what he eats to-day will be as palatable as what he may eat to-morrow.

The Pig Marketing Board, not without some opposition, has already taken certain steps to remedy this matter. Government has begun to take a profound interest in our pig industry. The present time of probable shortage of supplies is an opportune one for us to take this great industry in hand in all its phases and so develop it in our time of need that it may supply all our wants in war and by the prosperity so engendered, leave us with an organised and efficient industry when peace returns once more.

Everyone must play his part. There are great fields of endeavour open to the agriculturalist and the veterinary surgeon. The public too can play its part by specifying the home product and so help to bring prosperity to the pig farmer and to agriculture.

General Articles

METHODS OF HANDLING PIGS IN LARGE BACON FACTORIES

By D. J. ANTHONY, M.R.C.V.S., D.V.S.M. (Vict.)
Brierley Hill, Staffs.

PIGS arriving at the factories by road and rail are first sorted out and placed in pens according to the sender's consignment. Each lot of pigs is kept separate and flesh-marked with a mark allotted to the particular sender. The marking is done in such a way as to be easily visible on the slaughtered carcass during weighing at the factory. Facilities are provided at the lairages for resting, feeding and watering, whilst an emergency slaughterhouse and post-mortem room are also provided.

Slaughtering is done in the early morning, and is usually over, as far as pigs are concerned, by about 11 a.m. Commencing at 6 a.m., the factory machinery is set in motion, and pigs in the resting pens adjoining are gradually moved into the abattoir. They are moved into the hoisting pen in lots of three or four at a time, and are here stunned by means of an electric stunner, shackled, and hoisted by means of an electric hoist on to an overhead rail which carries each pig, hanging head downwards, on to the actual bleeding pen, where stands the slaughterman who incises the throat of each stunned animal as it passes on the rail.

After an interval for the draining away of blood from the carcass, and for all reflex movements to cease, the pig is dropped by means of a conveyor into the " scalding tub," and it remains here for a short time, being moved from one end to the other of the tub, whilst a preliminary hair-scraping is carried out. Pigs are removed from the water tub by means of a conveyor and carried into the hair-scraping machine, and from now on the carcass does not remain stationary until it arrives at the pre-cooling room. From the de-hairing machine the pig is moved on to a table with a moving head. Here claws are removed, and iron hooks inserted into the sinews of the hind legs prior to hanging on the conveyor rail. After a wash in a second tank of water the pig is carried by conveyors on to the rail where it hangs, head downwards on hooks, with iron bars inserted between the hind legs to keep them well apart.

The pig is now moved into the " dressing room " where the head is severed and its lymph glands examined. As the carcass passes around the dressing

floor on the "endless chain" system, various operations are performed upon it. Organs are removed and after marking (for identification) are passed on to conveyors and inspected, treated, stored, or sent out for fresh sale, as required, with as little delay as possible. The carcasses are split down the middle of the backbone (when required for curing by dry cure) by two men working with choppers on a movable platform, which moves at the same speed as the carcass. When the two sides have been split, stamped (both with a serial number and a sender's number) the carcass and head conveyors meet near the weighing scales, and heads are removed and placed on the carcasses for weighing. The numbering system and the flesh-marking ensure that the right pigs are allocated to the right sender.

Conveyors carry the two split sides, or the unsplit carcass to the pre-cooling rooms, where they remain until the afternoon, when they are once more moved by conveyors into the chill rooms to be kept there overnight ready for cutting up into various types of bacon "sides," hams, etc., the next day, and then being passed on to the curing cellars.

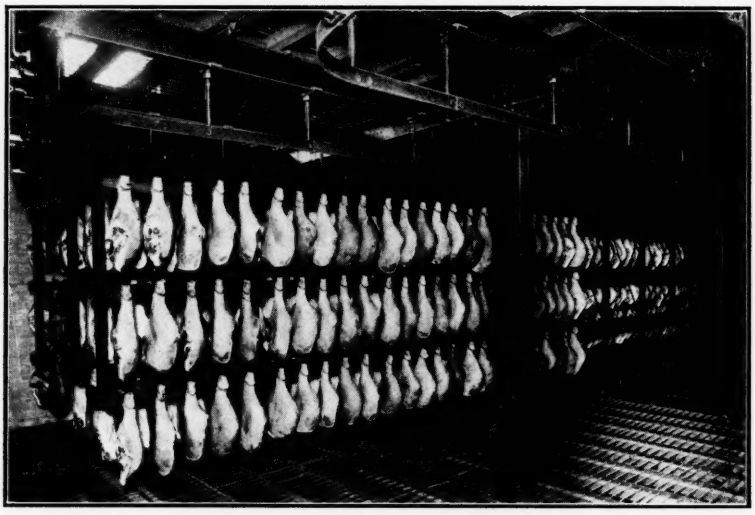
Suspected diseased animals are all labelled and inspected in detail, whilst superficial inspection is also carried out on all other carcasses and offal, the first inspection being usually carried out whilst the pigs are "on the conveyor," and the second after they come to rest in the pre-cooling rooms. These are large rooms having iron railings instead of walls, so that air can freely circulate all round, cool in summer and bitterly cold in winter, as the veterinary inspectors have good reason to know.

Owing to various requirements, such as insurance schemes, the number of conveyors in operation, etc., the inspectors have to pay great attention to the recording of disease, and for identification purposes a costly system of stainless steel numbered tags are employed, together with a system of paper labelling, boards marked with columns for diseases and organs, etc., fitted with hooks, on to which rings are placed whenever any organ, etc., is condemned. Use is made of trained butchers as lay inspectors for the preliminary inspection of less important offal, etc., whilst the control and supervision of the whole inspection system, ante- and post-mortem, remains in the hands of the veterinary surgeons, who, for the purpose, have to be officers of the local authority.

Pigs destined for curing as "Wiltshire sides" are dealt with in a somewhat similar manner, except that the whole spinal column is removed, and there are certain modifications in the trimming of the carcass.

Carcasses are not only subjected to inspection by veterinary surgeons, but are also graded by graders appointed under the Pig and Bacon Schemes. In addition, officials of the Bacon Board check up the weights of all meats sent down into the curing cellars. Thus there may be half a dozen officials belonging to outside bodies working in the one factory!

The carcasses go through a long process of manufacture before the finished



Corner of a ham drying room.

Pigs resting in a factory lairage. This shows the varying types of pigs encountered in individual consignments.

To face page 423.

article, i.e., cured side, or ham is ready for sale to the public. In the case of Wiltshire sides, these are smoked after curing, and sold as smoked Wiltshires. Such bacon is mild cured and needs a quick sale. The pale-dried bacon, on the other hand, is a product taking a longer time to manufacture, but will keep for a longer period than the tank-cured article. York hams remain to mature in the factory for as much as three months or over before they are sold to the public. They are frequently tested by inserting a steel skewer into the flesh next to the bone, for the detection of "taint." Numerous varieties of sausages, potted meats, etc., are also manufactured, all requiring careful hygienic supervision.

The non-edible by-products are also important. These are goods manufactured from waste material and condemned meats, etc. The most important by-product is commercial fat. All waste meats, etc., are rendered down by dry-rendering and chemical processes, and the fat extracted afterwards washed and treated until it is indistinguishable by naked eye from best leaf lard. Such commercial fat commands a high price, and the residue of bone and meat meal may be manufactured and sold as fertiliser, cattle foods, etc. Blood is also collected and sold as a by-product, as also is pig hair, the long tail and back bristles being treated and manufactured into brush bristles of varying sizes and colours, which are sold to the brush manufacturers who use the bristles for making various types of brushes such as tooth, shaving, clothes brushes, brooms, etc. The short hairs from flanks, etc., are treated by an ingenious process and after mixing with some long hair, such as horse hair and cows' tail hair, are finally turned out as padding for furniture, motor cars and general upholstery work.

At present no English bacon factory makes any medicinal gland products, as the pig supply is not sufficient to warrant the expenditure involved.

It is possible to fill a whole issue of this journal with an account of the various trades and processes dependent upon the pig, as of all the "food animals," it is undoubtedly one of the most "utilisable."

SOME RECENT ADVANCES IN PIG NUTRITION

By F. W. JACKSON, B.Sc., A.I.C.
Brierley Hill, Staffs.

THE following article cannot claim to be exhaustive; neither is it possible to enter into detail in any particular section. The literature devoted to nutrition in general becomes yearly more voluminous. Consequently the

advances made in the past twenty or even ten years are amazing, and one can only select a few salient features for discussion.

With regard to nutrition in general, pigs are in many ways ideal subjects to work on. Their inherent growth rate is so high that they soon show the effect of any deficiency (accidental or deliberate) in their diet: in other words, they may easily "enter into commitments that they cannot fulfil," with disastrous effects.

Ideas Regarding Defective Diets

It is now generally accepted that the food given to an animal is used for two main purposes, which are called "maintenance" and "production." Of course, it is impossible in practice to say where the one ends and the other begins; for instance, a young animal kept purposely on a maintenance ration will usually change its shape and show other signs that it is actually "growing" even though its weight remains constant.

For maintenance, it is assumed that the animal mainly requires food that provides energy (carbohydrates and fat); the demand for protein being very small, in accordance with the amount of wear and tear of the muscles and tissues that the animal experiences. An animal that is on a maintenance diet will excrete mineral substances, thus indicating that these are needed for normal metabolism.

When growth is taking place, the demands for nutriment are more insistent and also more complex. For our present purpose, growth must be regarded as rather more than mere increase in weight; so that the term includes both pregnancy and milk production, and anything that applies to the young growing animal can also hold good for gestation and lactation.

It is now becoming more and more obvious that, for purposes of growth, the animal has very definite and specific demands in the shape of raw materials. Not only are certain chemical elements essential, but they need, for the most part, to bear certain quantitative relationships to one another. As regards the proteins, certain molecular groupings must be supplied in the form of amino-acids, the animals being unable to make these groupings for themselves or to use other groupings instead.

Ideas along these lines automatically lead one to the application of the "law of the minimum" to a given scheme of feeding and to the conception that every ration contains a "limiting" factor. In order to get some mental picture as to what this means, it is perhaps advisable to think of growth as similar to a process like house building. In building a house a list of quantities can be drawn up, commencing with bricks, tiles, cement, and so on, down to little items like window-fasteners, screws, nails, etc. It is possible that, viewed as a continuous process, the number of houses completed per annum might be influenced quite considerably by the rate at which window-fasteners were supplied. In other words, window-fasteners in this case form the

limiting factor. It is obvious that, depending upon the nature of the limiting factor, a house could be regarded as either definitely incomplete or as jerry-built (complete but lacking lasting power). Similarly, with the growth of an animal, the raw materials may be presented (in the diet) in plentiful quantities; but whichever material is least abundant at once becomes the limiting factor: the rate of growth is governed by the rate at which this material is supplied, the profusion of supply of the other materials being simply wasted. There are, however, cases where, despite a known shortage of some material deemed to be essential, growth appears to proceed to maturity at normal rate; the animal is, however, liable to break down and is regarded as constitutionally weak.

This conception of a limiting factor is, of course, mathematically the same as that expressed in the words that "the strength of a chain is that of its weakest link." It is very useful, when criticising a ration or a system of feeding, to ask oneself automatically "what is the limiting factor (or the weakest link in the chain) here?"

Having explained this conception we are now able to consider the present state of our knowledge regarding certain sections of nutrition with pigs.

Protein

The approximate protein requirements of pigs at various stages of growth are now known. There are several methods of expressing how much protein should be present, but the original one based on the nutritive ratio seems to work well. This is obtained by calculating the ratio of the non-nitrogenous constituents (starch, oil and fibre) to the nitrogenous constituents (protein).

Satisfactory nutritive ratios for the various classes of pigs are:—

Milking sows and newly weaned pigs (up to 14 weeks old)—4 to 1;

In-pig sows (stock-boars) and pigs 14 to 20 weeks old—5 to 1;

Finishing bacon-pigs, 20 weeks old and upwards—6 to 1.

It is unusual nowadays to come across rations hopelessly deficient in protein. In other words, seldom is protein (as such) the limiting factor.

The more important aspect of the protein supply is what is usually referred to as its "quality." This is based on the fact that proteins are made up of simpler nitrogenous bodies called amino-acids and are broken down into these units during digestion. Over twenty different amino-acids are known and their proportions vary considerably in different proteins. Some five specific amino-acids are known to be essential if growth is to take place normally. These are distributed somewhat irregularly in foodstuffs and are best obtained from the proteins of animal origin. Grass, being a mixture of various species, appears normally to contain protein of high quality. On the other hand, cereals are in several cases amongst the poor quality supplies. In order to help overcome this quality problem it is well to aim at supplying

protein from as many specifically different sources as possible. To conclude this section we may group the protein sources as follows:—

(a) Best quality: milk, meat, blood, fish;
(b) Second best quality: bone, peas, beans, earth-nut, soya bean, yeast, linseed;
(c) Poor quality: barley, maize, oats, rice, wheat.

Minerals

The essential character of certain elements for the growth and maintenance of live animals is now generally understood. Thus, with bones one at once associates calcium and phosphorus, blood with iron, gastric juice with chlorine, and so on.

The use of a mineral mixture as a deliberate addition to the ration of growing pigs and breeding stock is now a routine practice. For some years the mixture consisted of boneflour, chalk, salt, oxide of iron, wood ashes and potassium iodide. It has, however, been found, mainly in conjunction with work on rickets, that in a ration consisting essentially of cereals there is usually plenty of phosphorus and that the largest deficiency is one of calcium only. Consequently it is now customary to omit boneflour and to use extra chalk in its place. The bulk of the mineral mixture thus consists of 3/4 or 5/6 of chalk, with 1/4 or 1/6 of common salt.

As regards iron oxide, the effectiveness of this has apparently always been accepted without question. The writer, however, as a result of certain investigations, has recently tried the water-soluble sulphate instead of the insoluble oxide. The immediate effect of this on all pigs was that the dung became much darker (presumably due to sulphide of iron). This suggests that oxide of iron passes through the pig undissolved. An experiment *in vitro* also suggested that oxide of iron is insoluble in warm gastric juice. One concludes tentatively from this that oxide of iron is of doubtful value in pig rations.

Of course, for breeding stock on pasture the grass may be regarded as a probable source of iron as well as of other minerals.

Nevertheless, the writer has found very large variations in the iron content of mixed herbage taken from different fields on a farm where the soil is sandy. It is thus possible for iron to be a "limiting factor" in certain cases. If the existence of iron deficiencies in soil and herbage be conceded, it is easy to imagine one reason why the turning out of sow and litter on pastures does not invariably cure nutritional anæmia.

This matter is of enhanced interest in view of the occurrence of "pine" in cattle and sheep (see this Journal, 1933, **89,** 99).

The addition of sulphate of iron to the mineral mixture intended for breeding and feeding pigs is thus an inexpensive but necessary method of ensuring against a shortage of iron in the diet.

Having thus briefly considered calcium, phosphorus, chlorine and iron, one can now pass on to the elements that are needed in smaller amounts. In animal tissues, in addition to the above, together with iodine and potassium, there are found silicon, bromine, magnesium, flourine, copper, manganese, lithium, zinc and many others in minute traces only.

This is rather a bewildering array and one at once begins to wonder whether these elements must be deliberately added to the diet in order to prevent a deficiency.

It must be conceded that the essential nature of many of these elements has not yet been proved, one difficulty in this case being that, with most of them, it is difficult to prepare a control ration from which they are absent. On the other hand, if they were not required by the animal for some specific purpose one would think that the animal would reject them as " foreign " bodies.

The ordinary diet of pigs, however, consists of cereal products, etc., all of which contain minerals derived from the soil. It is thus possible that this miscellaneous material supplies a good many of these essential elements. As to whether the supply is adequate can only be conjectured, and if one decides to play for safety in this respect there are two expedients that can be used, both of which are inexpensive and perhaps beneficial in other respects. The first is to give greenstuff of some kind, freshly gathered. Breeding stock and sucking pigs should be on pasture, wherever possible; growing pigs need the greenstuff to be brought to them. If greenstuff is not available, alfalfa meal may be used. In this way not only trace elements but also vitamins can be supplied.

The second expedient is to add to the mineral mixture 10 per cent. of wood ashes, which will supply potassium and traces of many other elements, depending largely on the nature of the soil on which the wood was grown. Wood ashes also supply charcoal, always a beneficial adjuvant to the diet, but no vitamins.

The writer has for some time been adding to his mineral mixture salts of copper, cobalt, nickel and manganese, in addition to the usual ingredients. This mixture is fed to all types of pig. It cannot be said to have shown any benefit to feeding pigs, but with breeding stock there is some evidence of good results, in the way of fewer ineffective services, more pigs and healthier pigs at birth. As has already been suggested, the effect of these additions is largely governed by the nature of the soil on which the pigs are running. Thus an addition which may cause an improvement in one district may have no effect in another.

Vitamins

The subject of vitamin supplies for pigs has recently received a good deal of attention, notably by Dunlop at Cambridge, and later by various workers at the National Dairying Research Institute at Reading. Briefly, the

XUM

position is this. The need by pigs for vitamin C has not yet been established: they appear to manage without it. As regards vitamin B, ordinary pig diets, consisting largely of cereal products, preclude the possibility of a shortage under all ordinary conditions.

Vitamin D, which prevents rickets, is not quite so important as was at first believed. When there is gross lack of proportion in the supplies of calcium and phosphorus in the food, vitamin D is very necessary. But when care is taken to correct this lack of balance, the need for vitamin D becomes less. As this vitamin D is usually present in both greenstuff and fish liver oils (see below), the need for a special supply of it is not likely to be felt in practice.

Last but not least is vitamin A, the anti-infective growth-promoting vitamin. It has now been definitely established that pigs need a comparatively large supply of this vitamin, a fact which is rather to be expected from their rate of growth. It is not at all difficult, under experimental conditions, to keep pigs on a diet deficient in this vitamin, in which case they sooner or later show symptoms of unmistakable nature, such as a starving coat, paralysis of the hind quarters, appearance of blindness, convulsive fits, head held on one side, and, of course, entire cessation of growth, sooner or later ending fatally.

A daily dose equivalent to 4,000 international units of vitamin A from weaning to bacon-weight appears to be sufficient to prevent these symptoms under all ordinary conditions. Using halibut liver oil, with a potency of 10,000 units of A per gramme, the daily dose is thus approximately 0.5 c.c., an amount so small that it does not appear to affect the texture of the carcass-fat or cause a fishy taint in the bacon. With cod-liver oil, whose potency is seldom as great as 1,000 units per gramme, the daily dose is at least 10 times as much; this raises the amount of oil in the ration to such an extent that soft fat and tainted produce are almost certain to arise. Thus for bacon-pigs halibut liver oil is to be preferred.

A very promising method which overcomes the tedium of a daily dose and also should have no effect on the produce is to give a "massive" dose of vitamin A to each pig shortly after weaning. For this purpose a small capsule is employed, containing 500,000 units of vitamin A in the form of a concentrate. This is sufficient to protect the pig until it reaches bacon-weight.

The cheapest and easiest material to use as a source of vitamin A (and D) is grass or other green food. Unfortunately, these are very variable in potency and the supply also is low in January, February and March. These are the months when young pigs are apt to slow up in growth and when a vitamin A concentrate is of definite benefit.

Another source of vitamin A is yellow maize (the white variety is useless). The important point to remember with vitamin A is its ease of oxidation, and this, of course, is facilitated when the material is exposed to

air and light in a finely divided state. Thus maize grains and maize meal slowly lose their potency: greenstuff does the same either after gathering or in the field after growth has ceased.

Lastly, there are meals on the market which are claimed to contain added vitamin A; obviously to be effective these require to be used soon after manufacture.

This subject of vitamin A for pigs opens up several interesting points.

It appears possible that, in a number of investigations carried out in the past, vitamin A was a limiting factor on one side and not on the other, so that there may have been two variable factors instead of one.

Another interesting point arises in connection with the vitamin content of sow's milk. Some years ago the writer experienced a form of unthriftiness amongst growing pigs which was not definitely diagnosed at the time. Roughly 50 per cent. of the pigs were affected, and it was found that these almost entirely came from large litters (nines, tens and so on); the unaffected pigs were from litters of six and seven. Obviously, the ration was not the cause, and other possibilities were also ruled out in turn. It was eventually presumed that this was a vitamin effect and that though all sows may give similar amounts in the milk, it is obvious that each pig in a litter of six would obtain a much large individual dose than those in a litter of nine. In view of recent investigations, the trouble appears to have been a shortage (serious, but not desperate) of vitamin A: what little the pigs had was derived from the mother and none was obtained in the subsequent feeding. The members of small litters had enough to last them until they reached bacon-weight; while those from large litters became exhausted a month or two before reaching this stage.

The whole subject is an interesting and difficult one, and the only advice to the pig producer is "if in doubt, feed a vitamin A/ concentrate." As in many other matters, prevention is better than cure, and it is often folly to put off remedial measures until the disorder has broken out. And with this final note, this survey must come to an end.

TREATMENT OF INFLUENZAL ARTHRITIS IN PIGS WITH M & B 693

By P. L. SHANKS, B.Sc., M.R.C.V.S.
Ireland

EXPERIMENTS using M & B 693 on an arthritic condition in pigs associated with an organism resembling H. influenza (described in the *Veterinary Record,* Vol. 51, No. 25) have given very satisfactory results, and the

following is a record of a number of outbreaks which have been treated with either Soluseptasine or 693.

Until February, 1939, the treatment of this joint condition had been most unsatisfactory. Not only was the mortality rate high (75 per cent.), but survivors remained lame and unthrifty for long periods. The use of salicylates, Epsom salts in bran mashes, and painting the joints with iodine had been recommended, but results were invariably disappointing and about 75 per cent. of affected pigs died. Early in February the experimental treatment of pneumonia in swine with injections of Soluseptasine was being carried out at a pig farm. It was noticed that in the pen adjoining the one containing the pneumonia cases two pigs were very lame. Examination showed that both pigs had swollen, painful joints with temperatures approximating to 108 deg. F. The owner informed us that the pigs had been bought in 10 days previously. This trouble had occurred previously on this farm on several occasions, death occurring despite treatment in each case in about 48 hours. The two affected pigs were injected with 30 c.c. of a 20 per cent. solution of Soluseptasine (M & B). The following morning the owner telephoned the laboratory and informed us that the two affected pigs had made a complete recovery and that he was quite unable to pick them out of the remaining pigs in the pen.

In March, 1939, three similarly affected pigs were sent to the laboratory for experimental purposes by another pig farmer. Encouraged by the results of the previous two cases, these three pigs were each given an injection of 30 c.c. of 20 per cent. Soluseptasine subcutaneously behind the ear. These pigs had recovered within 24 hours when the owner sent along two further cases which had become affected in the meantime. One of these pigs, which had a temperature of 109.2 deg. F., received 30 c.c. of 20 per cent. Soluseptasine and also recovered in 24 hours. As supplies of Soluseptasine were exhausted the second pig was given instead 1.5 grams of Proseptasine orally and instructions given to the owner to repeat this dosage twice that day and to continue dosing with 1.5 grams three times daily until recovery occurred. At the end of 24 hours the pig was so much improved that the owner refrained from further dosing. Complete recovery, however, did not take place until the fourth day.

Towards the end of March cases of this condition were reported in a litter of pigs still on the sow. Up till this date cultures from affected joints had generally proved sterile or in some instances a few colonies of Staphylococci had been recovered. Microscopical examination of smears from the joints, however, had sometimes revealed the presence of a fine Gram-ve bacillus. It was decided to use chocolate agar plates in this case, and from the joint of the first pigling a very fine growth appeared after 48 hours. In this outbreak, reported in the *Veterinary Record*, Vol. 51, No. 25, six pigs out of a litter of twelve became affected. No treatment was adopted in the

first five piglings since the bacteriology of the condition was of primary importance and all five succumbed to the disease. The sixth pig, however, was treated, using 30 c.c. of 20 per cent. Soluseptasine, with complete success. At the time of injecting its temperature was 108.4 deg. F. A few days later another outbreak was brought to our notice involving four out of a pen of eight recently purchased pigs. These pigs were prostrate and the owner expected them to be dead before our arrival. Temperatures ranged between 106.5 deg. F. and 108 deg. F. All four received 30 c.c. of 20 per cent. Soluseptasine, and two were completely recovered and the other two were walking about and feeding but still showed lameness after 24 hours. Recovery was complete in the latter two in 72 hours.

During the months of March and April a number of pigs affected with this disease were treated on a large pig farm where pigs are bought in periodically. Unfortunately, no accurate records are available of how many pigs were affected in any particular batch, but between twenty and thirty pigs were treated with successful results in each case. On several occasions sufficient Soluseptasine was not available to give every pig affected 30 c.c. of the 20 per cent. solution and it was noted that where smaller doses were given—never less than 10 c.c.—recovery was not so rapid, the pigs, although otherwise healthy and feeding well, remaining lame for three, four or five days after dosing.

On April 14 a litter of pigs on this farm developed the disease and it was decided to try M & B 693 on these piglings. The dose given was one tablet three times daily and it was found that complete recovery followed on one day's treatment. This treatment, being much cheaper, was thereafter substituted for Soluseptasine.

Sulphanilamide tablets were used on another series of cases of this arthritic disease amongst suckling piglings on this farm with unsatisfactory results; recovery being so slow that the owner on his own initiative dosed the piglings with M & B 693. Following the use of 693, the piglings recovered in 24 hours.

In April another series of cases was brought to our notice on a farm where this arthritic disease has appeared regularly shortly after pigs have been brought on to the farm. The owner in this case states that when he buys pigs from certain districts the disease always appears and that he has no trouble with pigs from certain other districts. We are unable to offer any reason for this. Treatment with M & B 693 was again 100 per cent. effective in curing the five cases on this farm.

The next case brought to our notice was in June. The owner had lost two pigs the previous day out of a batch of nine pigs, and four others were affected. An affected pig was brought to the laboratory. It was given four tablets of 693 and the owner was advised to give the same dose to the other five pigs. The farm was visited the following day, when all but the one brought to the laboratory were completely recovered. The owner reported

XUM

that that particular pig was almost better on its return home, but that it seemed to have a relapse. He was advised to give it a further dose of 693, and the pig was completely better the next day. It is possible that the journey back to the farm (about 45 miles) had some adverse effect on the treatment.

Mr. Lamont has kindly supplied the information in connection with the following two outbreaks. In June a farmer who had been experiencing considerable losses from this condition was sent to the laboratory with two live affected pigs by his veterinary surgeon. Both pigs were so seriously ill that the instructions were "to kill them and find out what was wrong." One pig recorded a temperature of 106 deg. and the other 108 deg. F. The pigs were prostrate, in great pain and squealed weakly when examined. The pigs were about 36 lb. in weight. Two grammes of 693 were given at 3.30 p.m. and one gramme at 9 p.m. to each pig. No further dosage was necessary and the pigs appeared completely recovered on the following evening. Five further cases occurred on this farm in this lot of pigs (19 pigs) which had been bought in a local fair seven days previously. All the cases responded to the use of 693.

Equally successful results were obtained in a series of three cases which occurred in a lot of eight pigs bought in a fair. The pigs were 11 weeks old and weighed about 40 lb. A single dose of 2.5 grammes effected a cure.

In recording this series of cases treated successfully with either Soluseptasine or 693, the opinion was expressed several times that the more acute the attack the more spectacular the results.

Messrs. May and Baker have suggested to us that, if possible, some cases should be given a thorough treatment with either Proseptasine or other Sulphanilamide preparation as equally good results may follow. If favourable opportunity presents itself, this will be done. It may be that readers of this Journal can provide this information.

PIGS IN VENEZUELA

By ED. MORGAN, F.R.C.V.S., D.V.H.

Venezuela, S. America.

Our description of the Venezuelan pig is different from that of the small boy who described the elephant as a square animal, inasmuch as the Venezuelan pig is a long-legged "razor-back" with a head almost half the length of the body. The colour varies from black, white, red (ginger) to a mixture of these colours. Probably the present-day pig of Venezuela differs a great deal from those first imported into the country by the Spaniards. During revolutions, etc., the pig also had to fight his own battles after finding himself adrift in the wilds. He had to search for his food which mainly consisted of roots, hence

the very long head which in shape resembles a ploughshare. Again, the narrow body on exceptionally long legs adapts him for running away when attacked by the jaguar and the puma. Judging by the speed they sprint during a stampede, even a cheetah would have no time to spare in keeping up with this racer. One most interesting feature which we often witness amongst some of the herds we come across on the plains of the Estate of Guarico is that they are solipeds, and the hoof resembles that of the mule, which feature alone, apart from being a non-ruminant, would prevent them from figuring in the menu card of the Jews.

Previous to the advent of the Venezuelan Meat and Products Packing-house at Puerto Cabello, the pigs in the interior of the country had been allowed, as stated, to run wild, almost like deer, and in some districts were considered more detrimental than beneficial. In most cases when killed they were simply utilised for lard. During the last 25 years this neglected animal has been placed on a better status and is considered worthy of a better treatment. There is nothing better to awake the breeders, who neglect their animals, than to find a ready market for the produce of their farms.

During my first travels in the interior of Venezuela, years ago, it often came to my mind quite freshly the remarks of an old Welsh Minister who, when preaching to a congregation composed mainly of lead miners who were then working on the slopes of Plynlimmon, addressed them as follows: "A farmer near my home at Llanbrynmair had a pig who set out every morning at dawn to the fields in search of food and was always accompanied by a goose. No sooner would he turn a worm up in the soil than the old goose would dart forward and swallow the worm, with the result that the pig got almost too lean and weak to walk back to the farmyard in the evenings, while the goose fattened and increased in weight. You men are the same as the pig; you work hard all day and in the evenings you hand all your earnings to the owner of the public-house in the village, who, like the goose, gets fat while you and your families are starving." We have often watched the herds of swine on the plains of Venezuela setting out from their dormitories at dawn and wherever it occurred to the mind of the leader to go, the others followed. Often a breeding sow with her litter following her turned up the soil and the young ones were ready for anything of value in the way of food, so that one wondered how the mother could exist when the young seemed to take all the food.

The majority of the pigs run wild on the plains until the maize in the enclosed cultivated areas is ripe, then gaps are made in the fences here and there to allow the pigs to enter, which they do at night. No sooner than one of these finds an entry, the others soon follow, after which the gaps are closed. These ferocious animals are then gradually dominated by driving them to the yards to castrate the young, and also any old ones which might have escaped the ordeal in previous years. Dogs are used to attend the herds of swine, the

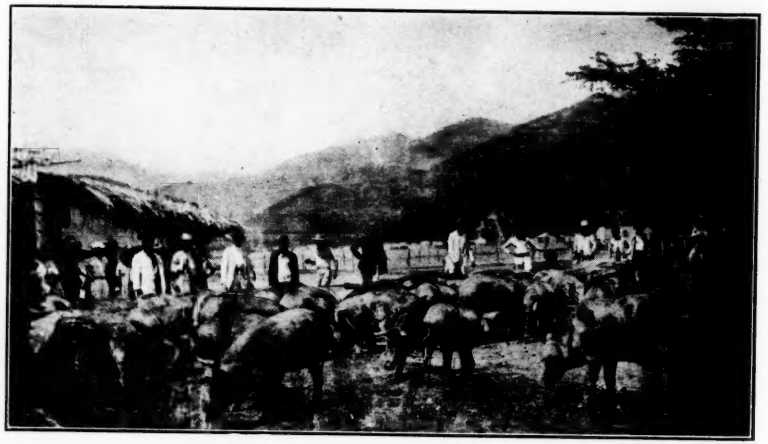
XUM

same as sheep-dogs are used to attend the flocks in different countries. These pigs are allowed to remain in these enclosed corn fields until they are fit for the slaughterhouse, to where they are trooped in large mobs, often on foot. During the dry season many are also taken by lorries. When driven on foot great care is needed so as to avoid stampeding. They are attended by men on foot and one or more dogs. One man walks in front with a wooden bowl containing grains of maize which he rattles all the time, something after the fashion of one trying to catch a horse in a field by coaxing him with a little corn. Very often these pigs have to swim across fairly wide and deep rivers. Here one appreciates the value of the dogs more than anywhere, because when a pig is inclined to give way and go with the current, the dog swims alongside and pulls him by the ears until he gets across the stream, which explains the number of torn ears encountered at the slaughterhouse. The dogs are often of the beagle type, imported originally from France. They are trained for this work, and when the pigs are despatched to the central markets from the interior the dogs, like the men, are allowed so much money towards their rations there and back. Due to better roads nowadays, the lorries are able in some districts to go nearer to the pig-breeding centres, even during the rainy season, which has been the means in some districts of changing the old custom of trooping them for hundreds of miles to the central market.

During recent years an attempt is being made by the Government and others to improve the type of pig by importing from the U.S.A. the Duroc Jersey, Poland China, and the Berkshire. These are crossed with the razor-back pigs. The two former breeds are suitable for producing pigs for bacon curing, but as Venezuela imports such large quantities of lard annually, obviously the Berkshire cross is the most suitable pig for such purposes. Apart from one small centre in Venezuela, bacon and ham curing is unknown, hence the value of the pig is according to the quantity of lard it produces. When pigs are sold in Venezuela there is no questioning the carcass weight, but instead how many bottles of lard will it yield? One can buy pork in the markets stripped of the rind and all possible traces of fat, as the latter is rendered into lard. There is a ready sale for the remaining cooked rind and any small bits of meat attached to it which is considered a delicacy in Venezuela, called " Chicharon." In spite of the long journeys which the pigs endure in a tropical country by foot and by lorries, which travel at night so as to avoid the heat, the dressed carcasses with the head on yield about 75 per cent. in proportion to the live weight, i.e., when the pigs have been properly fed on maize for several months prior to slaughter.

Diseases

The most prevalent ones encountered in the slaughterhouse are parasitic, namely, measly pork, due to the presence of Cysticercus cellulosæ, and another caused by the kidney worm, Stefanurus dentatus. The former is prevalent in



Venezuelan pigs.

To face page 435

pigs around towns where they roam at will and act as scavengers. From one district in the republic we have discovered as many as 30 per cent. of the pigs harbouring C. cellulosæ. On the other hand, the percentage of measly pork in the pigs brought in directly from the plains is but trivial. In spite of the pigs from the plains, when kept far from dwelling houses, being almost all free from C. cellulosæ, nevertheless they contain almost without exception the parasite Stefanurus dentatus, many in an advanced stage, not only in and around the kidney, but in other organs of the body. The old custom in Venezuela, when selling pigs for the slaughterhouse, is that the one who sells must stand the loss when the carcass is highly infected with C. cellulosæ and totally condemned. If of a mild infection, the seller is allowed a percentage for the fat which is rendered into lard. The pig breeders and merchants are experts on diagnosing the presence of the bladder worm, C. cellulosæ, in their pigs. They cast each pig on its back over, for instance, a motor-car tyre which is laid on the ground, and by means of a piece of wood of about an inch in thickness the mouth is kept open and the tongue is carefully examined all around for bladders or cysts, which they call Huevitos (little eggs). The mucous membranes around the eye are carefully examined as the small bladders are detected often in one or either of these places. Not only are they detected, but very often they are pierced by a sharp, long needle, and the contents withdrawn so as to deceive the next buyer after these heal up. Very often the eyes of highly infected pigs at certain periods are congested, blood-shot. This is taken as a sure symptom of Cysticercosis. It is important to draw the attention of students to what appears rather misleading in some textbooks on meat inspection, namely, that the most important centres for examining pigs' carcasses for detecting Cysticercosis are the masseters, tongue and heart. Quite true that these are important, as are all muscular parts of the body and intervertebral spaces, etc. What should be impressed on the minds of students is the following: should the tongue, masseters and heart appear free of Cysticercosis, the inspector must not certify the carcass free of measles. This occurred in the chief slaughterhouse in Venezuela when it was once the custom to distribute the dressed carcasses with the heads intact by proper meat lorries to various towns and handed over to retailers, after having previously been examined, i.e., the masseters, hearts and tongues, which were found free of Cysticercosis. When the retailers and butchers cut up the carcasses to suit their customers, they often discovered Cysticerci in certain deep areas of the muscles, particularly the hind limbs. In others they discovered Cysticercosis when splitting the vertebral column, etc. Owing to continuous complaints the inspectors are now obliged to mutilate the carcasses in order to issue a certificate of freedom from this disease. Pork infected with Cysticercosis and kept in freezing rooms for a week at a temperature below zero is rendered harmless, hence the reason for Cysticercosis being rendered sterile in imported frozen pork.

Symptoms of Kidney-worm.—When highly infected, the pigs often, during or after a long journey, manifest symptoms of paralysis of the hind quarters, and sometimes are found on the ground unable to regain the use of their hind legs. There are many other diseases amongst pigs in Venezuela, but the above-mentioned ones are the most prevalent. The illustration may serve to give readers an idea of the appearance of the Venezuelan pig, which merits a place at the Zoo, and even then some would be inclined to cry out like the farmer at the Zoo who saw the giraffe, " There ain't no such animal."

NOTES ON PARATYPHOID IN SWINE

By F. BECKETT, F.R.C.V.S.
Blandford, Dorset.

In times like the present one's sense of values change, sadly enough, not always for the better, and I therefore must confess that I find it somewhat difficult to settle down to write this article. I have chosen the subject of paratyphoid for several reasons: (1) that the paper presented by Dr. Manninger at the Great Yarmouth Congress largely dealt with this condition and those intimately associated with it; (2) because it was not my good fortune to be present when this paper was read; and (3) his paper almost entirely confirms those arguments put forward by me in published articles and papers given as far back as 1932. On reading this excellent paper and the discussion which followed I do not consider that sufficient emphasis was given to the important, if not the two most important, features in connection with this disease. First, it cannot be denied that in this country at least, paratyphoid and its associated conditions assume alarming proportions and in the aggregate is by far the greatest cause of loss to pig breeders. Secondly, the contagious nature of the condition. I feel sure my contention that paratyphoid is contagious will be strongly denied by some authorities, but long association with this disease leaves no doubt in my mind and only lack of space prevents me from giving figures and details in support of this theory.

It has been suggested that infection by Brucellæ is a contributory factor in so far that it creates a susceptibility to dysentery in new-born pigs. While it may do so in other countries, I do not consider it a dangerous factor in Britain, having taken several hundred blood samples without obtaining a positive result to the agglutination test. There is little doubt that debilitating diseases of the sow, incorrect feeding of the dam before and after farrowing, bad housing, etc., all tend to cause congenital weakness in the offspring. One of those conditions likely to be detrimental to the sow and her young is the land itself and to my mind the most important factor of all; healthy land means healthy stock.

A careful study of the trend of events since 1920 gives ample scope for thought. Immediately following the last war great numbers of people purchased smallholdings and went in for intensive poultry breeding. For a time these adventures were successful, but with the passage of time great changes were seen, and it became the exception rather than the rule to come across really healthy flocks of birds. The same state of affairs exists to some extent in grass-fed sheep, and again cattle and pigs cannot be said to be unaffected.

In these days of intensive farming it is more than ever necessary to maintain land in a clean and healthy condition. If it is our endeavour to rear healthy stock, it is essential to maintain them on healthy land, and to gain this end the land must be worked. I submit that it is almost useless to add various minerals and vitamins to the diet if the land itself is not in good heart.

There can be now little argument with the submission that two of the chief characteristics of paratyphoid are: (1) the age of the animal affected, and (2) the seasonal incidence. It is more or less common knowledge that it is a disease of young pigs, particularly in the early store stage, and it is extremely rare to come across a case in an animal over six months old. Further, records kept over a period of many years, showing the deaths in outbreaks of this nature, reveal a heavy winter mortality. The mortality curve begins to rise about October, reaching its peak in January and February; with the advent of spring the losses rapidly decrease. Therefore one can readily see that the disease is at its height from November to March. The time factor is also constant, that is, if careful records of outbreaks are kept over a long period and any given period taken for any year, the severity of the attack is for all practical purposes the same.

I do not propose to go into the lesions shown on post-mortem examination in cases of paratyphoid, for the reason that I described them very fully in an article published in this journal some years ago.

I entirely agree with Dr. Manninger in his refusal to accept the theory that paratyphoid is caused exclusively by infection with the virus of piglet influenza. One must agree that paratyphoid and piglet influenza occur simultaneously, but it is my experience that this is far from being a constant factor.

There are still some workers who place the responsibility for outbreaks of paratyphoid on the swine fever virus. If this is the case then it must be assumed that in cases of low mortality the pigs have developed some immunity and the possibility that the virus was low grade in type. The evidence against this line of thought is so overwhelming that one is forced to refute the possibility of the virus of swine fever being the causal organism.

In support of my argument I will quote the case of a herd in which paratyphoid had been in existence for three years. A number of breeding animals, between 40 and 50 in number, purchased in different parts of the country, were introduced into the herd. These were adult animals, and while no special precautions were taken, no deaths took place among them. If one

had been dealing with a low-grade virus, it is reasonable to suppose that at some time or other the virulence would increase, with dire results to the imported stock.

The experience of Dr. Manninger in attempting a cure by means of vaccines or serums appears to be similar to that of other workers; except in odd outbreaks these measures have met with little success, while good results have been obtained by improved dietetic measures, good housing, the feeding of iron and other minerals, and, above all, by pigs being maintained in the open.

I have carried out various experiments, inoculating pigs with swine fever serum, S. surpestifes, etc. Each experiment was carried out on not less than 1,400 animals and careful records kept up to the time they were disposed of to the bacon factory. In each batch at least 400 were kept as controls. The animals were weighed each fortnight and records kept of the prices obtained at the factory. The results were of considerable interest, although they appeared somewhat negative. The percentage of deaths of inoculated and controls was about the same, and there was little variation in the condition of the animals and prices obtained at the time of delivery to the bacon factory.

Dr. Manninger mentions the quite considerable attention paid at last year's meeting of the N.V.M.A. to Waldmann's separate hut and run. It has always been a source of wonder to me why this system received so much attention; it would appear to be Waldmann's attempt to "gild the lily." Its chief virtue is that it ensures pigs being kept in the open, but on the other hand, it has too much the appearance of a semi-permanent nature. It cannot be compared for real efficiency and economy with the ordinary movable pens. A practical method is to have small movable pens (36 ft. by 27 ft.) with a portable wooden hut in each. This pen accommodates either three dry sows or a sow and her litter. This method, apart from its efficiency and economy, removes the temptation to a great extent of maintaining pigs too long on the same ground, a very real danger in Waldmann's method.

While I believe that, in common with many other diseases, swine fever and paratyphoid cannot, or shall I say it is unwise to attempt it, be diagnosed on a single lesion, Dr. Manninger's remarks on the "button" ulcer were of the greatest interest to me. So much attention has been paid to ulceration in the past that I have constantly advocated that the presence of ulceration in any form in the bowel of the pig should be viewed without panic, and a comprehensive examination of the carcass be completed before any attempt at diagnosis be made. With this data, the clinical history of the herd and the premises, then and then only can the diagnosis have any hope of accuracy. At the same time, I am happy to be in complete accord with Dr. Manninger in his comments on the "button" ulcer. I have described in detail elsewhere the type of ulceration and diphtherices found in paratyphoid, and the description does not differ materially from that described by him, and in no case of

paratyphoid have I come across anything approaching the true concentric "button" ulcer commonly found in cases of true swine fever. It would appear that many find it extremely difficult to differentiate between paratyphoid and true swine fever. While one must agree that in certain outbreaks in which the post-mortem findings are inconclusive, the clinical history incomplete and possibly further complicated by the recent addition of fresh animals to the herd, a diagnosis must be delayed. In the main, however, I consider it to be comparatively easy to differentiate between the two conditions.

The major differences between the two are: swine fever is a true septicæmia caused by a virus and may be complicated by secondary invaders; paratyphoid is caused by S. surpestifes. Swine fever attacks pigs of all ages, sex and breed, while paratyphoid is a disease of young pigs, the greatest number of deaths taking place between the ages of eight weeks and 4½ months. It is unknown in adults. The seasonal incidence is striking in the case of paratyphoid.

It will be agreed by all those with clinical experience that infectious diseases cannot always be expected to appear in a really characteristic or text-book form, and therefore difficulties will be met with considerable frequency when one's efforts are directed towards an early and accurate diagnosis of either swine fever or paratyphoid. It is also equally true that animal inoculation as a method of diagnosis is impracticable because of the expense and the length of time required by this method.

It therefore follows that an early diagnosis depends on the care and efficiency of the clinician making the investigation, and it is my belief that in the vast majority of outbreaks a diagnosis can be arrived at, provided the clinician makes a full and comprehensive investigation of the outbreak. In an attempt to differentiate between swine fever and paratyphoid the following facts should be ascertained: the length of time the disease has been in existence in the herd; the age and number of animals affected; whether swine fever has previously existed on the premises; whether recent purchases have been made and their origin; movements of any description, both of the owner and his stock. A careful survey of this data, the examination of the herd as a whole, together with the post-mortem findings should enable one to arrive at a decision without too much difficulty.

In conclusion, I would like to emphasise once again the enormous loss suffered by pig breeders from paratyphoid, and also its contagious character. There is no doubt that in outbreaks of any size that have been in existence for some time the organism becomes extremely virulent and the necessity for immediate isolation of affected animals is essential. I would also plead for a balanced team when research work on pig diseases is carried out, for while it is of the utmost importance that experienced bacteriologists and pathologists are employed, it is equally necessary to obtain the help of experienced and practical clinicians.

THE VETERINARY PRACTITIONER AND THE PIG

By J. T. SHARE JONES, D.V.Sc., M.Sc., F.R.C.V.S., Emeritus Professor, M.D. (V., h.c.)
University of Liverpool.

WHEN invited to write a few lines on the pig for this special issue, it seemed to me that this useful animal in relation to veterinary science has receded to such a degree as to be almost excluded from veterinary practice, and that in the public interest every effort should be made to bring it back into the sphere of the general practitioner.

One reason for the decay of this side of practice is not far to seek. It is apparent to every farmer who has adopted the policy of mixed farming, which included the pig, and amongst whom the writer includes himself. Of the factors which have brought it about, one of the most important is the manner in which legislation, operating through the various Orders of the Government Department concerned, has been applied in the field. When giving evidence on this some years ago I expressed my considered opinion that the relationship between those engaged in the industry and the officials controlling them was too distant and, rightly or wrongly, the latter had come to be regarded, not as helpers as they should be, but as a type of prosecutor or persecutor. Their mission was misunderstood, and this tended to the concealment of disease rather than a ready and frank revelation of its existence, in other words, that a prompt system of notification, which is perhaps the greatest essential in the eradication of disease and of preventive medicine, was practically non-existent. The dread of State interference was inherent. The visit of an inspector of any type was regarded by the neighbours as a kind of reproach on the farmer, consequently he was not a welcome visitor. Whilst admitting that at times the individual might have been at fault—there has often been noted the tendency of a young officer, invested suddenly with authority, to surround himself with an officious atmosphere—it was probably due in great measure to the system that made this possible. The result was a tendency to conceal disease rather than deal with it. Recently there has come about a marked and pleasing change in the relationship referred to. But the effect of the preceding period remained, and the pig came to be regarded simply in terms of the scheduled diseases. The many other ordinary ailments to which he is subject were neglected, and the use of veterinary science in the field of therapeutics diminished.

Concurrently, the pig as a commercial asset had been rapidly losing its position in this country, and was being ousted by the products of other countries, particularly Denmark. When the latter country made the great change-over from arable farming to animal husbandry only half a century ago, the products of the dairy and the pig were made its chief concern. The Danes

studied the public needs, and allowed these to dictate their methods. For example, they took particular note of the dislike of the average Britisher for very fat meat, and his partiality for that which was mildly cured, and Danish bacon captured our market. In this country the important connection between the farmer and the housewife as his ultimate customer was scarcely noted. But we also are changing, and instead of the once popular small " stumpy " animal that was fed and fed, and which simply expanded sideways until he became nothing but " a bag of fat " which, though capable of winning a cup at a fat stock show, was a wicked waste of food material utilised in the production of an animal for which there was no market, it is now recognised that it is the lengthy porker or not too heavy bacon pig that is required. As evidence of this one has only to visit the exhibition of pigs and their fresh and preserved products now held annually at, say, Peterborough, to conclude at once that the solution lies with ourselves. As a guest, I attended last year the great celebrations at Copenhagen of the conversion of Denmark to peasant farming, and later to the animal industry. Good as their methods undoubtedly are, their soil and climate are not superior to those of Britain, and there is no better indigenous livestock than that with which we are endowed. The fallacy of allowing ourselves to drift into the position of having to import from Denmark such a high percentage of this essential food material is at the present moment actually forcing itself upon us with tragic suddenness and importance.

It will not be allowed to recur. The tremendous importance of the pig and its products in our national dietary, and the ease with which it can be produced and developed in this country, indicate clearly our future policy, in which the pig should be considered alongside the cow. The successful cheese farmer recognises this, and one hundred cows in full milk necessarily mean about six hundred pigs, the by-product of the cheese factory forming a basic food for the pig. The extraordinary market fluctuations, which seemed, somehow, inseparable from the pig, are to such a farmer without detrimental effect on the annual returns, since the flow into the market would be constant and the lowest and highest prices obtained. This was recognised by the dairy farmers of Shropshire and Cheshire where, until the recent legislative upheaval, so many farms were small cheese factories, producing a world-renowned commodity, with a steady flow of pigs.

Whether it be correct or not, as reported in some quarters recently, that only one ship had got through from Denmark with food for Britain, the acknowledged shortage of bacon forces upon us the urgent necessity for the intensive application of our energies to home pig production. The politicians recognise it as a national need of the first order. Here veterinary science, including as it does genetics, anatomy, physiology, hygiene, and dietetics, should be given a real chance to play its part, a part that does not lie within the power of any other division of science to equal, much less excel. The value of the veterinary practitioner trained in these subjects makes him pre-eminently the

adviser to the industry. To him surely should be committed not only the prevention and cure of disease, but the problem of the production, care, development and use of the animal and the commodities derived from it during life and after death. To neglect to use him in connection with the production and development of an animal that is his peculiar and special charge is to withhold from the industry knowledge that is essential to its successful prosecution. Were it a human subject, there would be no question as to the requisition of the family doctor. The opportunity is here—the need outstanding. There should be no hesitation on the part of those who provide the science or those who would profit from it. This is one of the nation's paramount needs of the hour. It would be difficult to estimate the great contribution that can be made by the pig during war, when the time factor plays a predominant part.

FAMILIAL MASTITIS IN SOWS

By V. BERWYN JONES, M.R.C.V.S.
Wonersh, Nr. Guildford.

THE particular interest of the following cases is that the disease was manifest only in sows of the same breeding and age and did not appear until their third farrowings; the previous farrowings being normal and without incident, their litters reared successfully and without loss.

The herd is composed of Middle Whites crossed by Large White Boars, and numbers some 200. Until recently it was housed in scattered sties and cattle yards, but after the death of two of these cases, and because it was considered that damp and draughty housing might have been a factor in the causation of the disease, the herd was re-housed in a newly erected Danish type house with slotted floors, etc., and ideal general conditions. Since the re-housing, three have become affected, but no sows of any other strain and no other pigs have been ill from any cause. Except for these cases, the disease history sheet of the herd is blank.

Until 24 hours before farrowing the sows appear in perfect health; one of the first signs of trouble to come is a slight thickening of the tissues between the two hind udders. At this time and usually for six hours after farrowing the temperature is normal and the sow feeds and behaves normally. In no case of death has there been any manual help or interference. After the sixth hour the temperature rapidly rises to 105 deg. upwards to 107 deg. With the rising temperature there is observed an extension of the mastitis from behind forwards, one side becoming more rapidly affected than the other. In a mild case this extension stops short at two, or three, or four glands. In severe cases there is rapid involvement of all the glands followed by septicæmia and death in 48 hours or so unless very active measures are taken to combat the infection.

As a rule, the first sign that all is not well is that the sow is not interested

in her feed; at this time there may be no rise in temperature, but the indurations of the udder can be palpated.

The post-mortem picture was purely one of septicæmia and nothing in the nature of previously acquired disease was noted. Attempts were made to obtain swabs from the vagina and uterus and samples of milk for culture purposes, but, possibly owing to the enormous difficulty of obtaining these without contamination, the pathologist could not incriminate any particular organism.

However, bearing in mind a similar type of disease which is not uncommon in the larger breed of dogs, e.g., Mastiffs and Great Danes, which has been noted to be due to a hæmolytic streptococcus, it was resolved to try the effect of Sulphanilamide, although it may be noted that in dogs mammary abscess formation and/or necrosis and gangrene of the glands is not uncommon, no actual abscess formation has occurred in the cases reported.

Prontosil Rubrum was given to the sows, intramuscularly, in 30 c.c. doses of the 5 per cent. solution every four hours; at the same time a uterine douche of one pint of 1 : 1000 Acriflavine in warm sterile water was administered by means of a cattle abortion syringe. Neither operation appeared to have any direct or dramatic effect on temperature reduction. Nevertheless, the treatment was persevered with for four days. At the end of this period the sows appeared to be brighter, the temperatures slowly receding; some appetite returned and they proceeded to make a slow convalescence. In contrast, those that were untreated died within three days of farrowing.

The recovered pigs have never regained normal udders, induration remains. Their litters have been hand-reared, or fostered, and all successfully brought to maturity.

SOME SKIN AILMENTS OF THE PIG

By G. MAYALL, M.R.C.V.S.
Bolton, Lancs.

Do pigs perspire? We don't know. If they do, possibly some of our readers may enlighten us. If they do not, this may account for the origin of not a few of their integumentary troubles or at any rate for their persistence. There is one abnormality occasionally seen in old boars called *sclerodermy* in which a tough, hard extensive patch of skin may cover a good portion of the back and here at all events there is no sweating.

The longer we live the more we are convinced that the skin of all animals from the elephant to the nutria ought to receive periodic attention and hygienic supervision. In fact we should like to see a book or pamphlet solely devoted to the hygiene of the skin of the domesticated animals. Perhaps one of the most frequently seen skin maladies of the pig is *eczema*, which occurs in young badly-cared for swine living in dirty sties. Over

use of potatoes may cause potato eczema. In young pigs it may be of an infectious nature and spread among different litters and affect the teats of the sow. In some cases it is noticeable by its black or brown appearance and has been called *soot* or *pitch scab.* Cleansing of sty and equipment and laxative food, if the pigs be fat and more nourishing if poor are indicated.

At the same time dressing the skins with an emollient liniment, removal of the softened scabs and application of antiseptic ointment will remove the trouble.

On very hot days in summer, pigs may suffer from a kind of *erythema* due to the sun's rays which may be enhanced by the use of unsuitable food such as spoiled fodder or distillers wash. Here the provision of shade is necessary and a brisk cathartic dose may be useful which may be given as *an electuary* (often overlooked as a convenient and suitable method of giving medicine to pigs which obviates the objectionable method of the old boot, castor oil, and roping the pig's mouth). A mild dressing of the skin with a bland anodyne lotion will also add to the comfort of the pig. *Urticaria* or *Nettlerash* is a common skin malady of swine seen chiefly in spring and summer. It is usually due to filthy conditions and sudden changes of food or the feeding of certain classes of leguminous plants. It is often sudden in its onset and may appear in a night or half a day. The remedy is to clear out the feed lots and keep them clean and free from vermin and give the pigs a brisk dose of Epsom salts in sloppy food. *Ringworm* may occur and spread rapidly in swine and is rather troublesome to get rid of. Separate healthy from affected pigs. Give cooling diet and dress the skin with sulphur ointment or other antiparasitic application. Scrupulous attention must be paid to the sty and all woodwork, and it should be limewashed and disinfected. *Scabies* or *Mange* is due to a parasite that burrows under the skin and is called sarcoptes scabei and is communicable to man, ox and the goat. I comment on this malady in "Pigs, Pigsties and Pork" and cannot do better than quote Mr. J. A. Griffiths, M.R.C.V.S., who writing in "The Veterinary Record" for June 15, 1918, described an outbreak in some pigs treated by him. He dressed the pigs with a mixture of 25 per cent. of sulphur and 2 per cent. of oil of tar, with fish oil as a base and the following day they were scrubbed with soap and hot water containing sodium carbonate. The sulphur dressing was applied three times and the bath repeated at the end of a week and the sulphur dressings continued at weekly intervals. It took six to eight weeks to cure the pigs. In this case the disease was introduced by a scabby boar so that the importance of maintaining the perfect health of the lord of the harem cannot be too strongly impressed on pig breeders.

Remarks

It is worth noting that in *open air* pig keeping there is less likelihood of skin troubles. The free movement in the open air, a modicum of pasturage

and hygienic facilities all contribute to the maintenance of a healthy skin in the pig. If we were asked what are the most useful internal drugs to use in skin therapeutics and digestive disturbances in the pig, we should reply sulphur, calomel, jalap, sodium and magnesium sulphate and istin. Sometimes the bowels of the pig take a lot of moving.

METHODS ADOPTED TO CONTROL DISEASE ON A PIG FARM

By P. L. SHANKS, B.Sc., M.R.C.V.S.
Vet. Res. Division, Stormont, Belfast.

THE following article deals with the methods adopted during the past four years to control the incidence of disease on a large pig farm in Northern Ireland and the results of these measures. The farmer keeps a very accurate record of everything done on the farm and we are indebted to him for supplying us with exact figures.

Prior to adopting serious measures to counteract disease the monthly mortality among an average total stock of 3,500 pigs was 120 pigs of all ages. In addition, an average of 40 pigs per month were slaughtered and salvaged.

In 1936 mortality increased so seriously that determined efforts were made to counteract the disease incidence. In April, 1936, which was the blackest month in the history of this farm, a total of 273 pigs died. The high increase in deaths was due to an outbreak of acute paratyphoid amongst piglings on the sow. During that month the mortality figure of 273 was made up as follows: piglings aged 1 to 7 days, 33; piglings 1 to 5 weeks old, 132; piglings 6 to 8 weeks old, 28; piglings 9 to 12 weeks old, 15; pigs over 12 weeks old, 65. In addition to these deaths, 68 pigs were slaughtered and salvaged.

At that time the farm was managed on what would then have been considered quite satisfactory lines for a commercial pig farm. The fattening houses were large and open, mainly consisting of a row of pens on either side of a passage. The pens were separated from each other by concrete walls three feet in height. The house in which the sows and litters were kept consisted of four rows of pens under one roof, while one of the rows of fattening houses had yards attached. These houses were all definitely cold and airy and it was impossible to obtain an equable temperature. Ordinary cleanliness was observed. The pens were cleaned out daily and the houses were usually cleaned fairly well and disinfected before a fresh lot of pigs arrived. The sows and litters were confined to the house during the suckling period. As soon as the piglings were weaned the sows were turned out to a field and remained there until a fortnight before farrowing when they were again

housed. At times during the winter months the sows were housed and did not get a free run in a field. Anæmia in the piglings was very prevalent at such times and many of the piglings on post-mortem showed definite evidence of anæmia. The treatment of anæmia was carried out in a desultory manner. During the early months of 1936 the sows were kept indoors to a large extent and in April a large number of blood samples taken from piglings within a week of birth and from the sows suckling these litters showed an abnormally low hæmoglobin figure. Dosing with iron was then systematically carried out for a period and the use of a formalised vaccine for the prevention of paratyphoid was adopted. Cleansing and disinfection of the houses was carried out more thoroughly. This controlled the serious losses amongst young pigs to some extent and the average monthly mortality for the rest of the year was 124. Results, however, were not sufficiently satisfactory. Cases of acute paratyphoid still occurred which wiped out complete litters on occasions. There was a large number of cases of necrotic enteritis. Pneumonia in pigs from 16 to 24 weeks old began to assume serious proportions. It should be stated that coughing and sneezing in piglets was common and invariably a varying degree of pneumonia was found in most of the pigs examined post-mortem. The iron treatment for the piglings was continued and cod liver oil was added to the iron mixture. It might be worth mentioning that the use of the iron and treacle mixture for painting the sow's udder was not considered as satisfactory in the treatment and prevention of anæmia as regular dosing with a teaspoonful of a mixture of 3 drachms iron sulphate and 1 drachm of copper sulphate in one pint of water. At this time, too, a fair number of deaths from navel ill were encountered and painting of the navel of the piglings with iodine at birth was put into practice with completely satisfactory results.

To try to control still further the incidence of paratyphoid an intensive campaign was launched against the possibility of dirty pens being the source of infection. A high-pressure hose was obtained and the pens were thoroughly cleaned every week. Before a fresh batch of pigs was put into a house the house was hosed and scraped down and the floors soaked in disinfectant for at least 24 hours and again washed and allowed to dry before putting in the pigs. On one occasion when 5 per cent. copper sulphate was used and the disinfectant was not washed away, six pigs of a batch put in the pen died from copper sulphate poisoning. On post-mortem examination there was severe inflammation of the stomachs and a greenish-blue colouration from the blue stone was found throughout the whole intestine. This rigorous cleansing and disinfection of the pens was begun in April, 1937, and continued until November of that year. Mortality figures still continued high, e.g., during the month of October 160 pigs died out of a population of 4,254, and 40 pigs were slaughtered and salvaged. These 40 pigs were nearly all pneumonia cases. Attempts were made to control the pneumonia, using blood serum from recovered cases in doses from 10 c.c. to 50 c.c. Results were very successful

(12 complete recoveries out of 13 cases treated), but the difficulty in obtaining sufficient quantities of serum was so great that that method of treatment was abandoned. Since the owner slaughtered a large number of his pigs at his own abattoir it was decided to test the value of dried blood from these slaughtered pigs, many of which had pneumonia to a greater or lesser extent, when added to the pigs' ration. This trial was carried out for several months without any beneficial effect being noted and the practice was discontinued.

During the summer of 1937 it was found that if pigs in the early stages of pneumonia were removed at once to some outlying buildings near the abattoir they invariably recovered. The beneficial effects of isolating cases of pneumonia had been noted by us previously when pigs brought by farmers to the laboratory had recovered naturally after a few days' isolation. The necessity for building a hospital for sick pigs was thus impressed on the farmer and in September, 1937, a hospital to accommodate about 100 sick pigs was erected. The hospital consisted of two rows of small pens on either side of a passage. The pens were of wood and were, on an average, four feet square, but were so constructed that they could be made smaller or larger to accommodate each particular case. Separate troughs were provided in each pen together with a sleeping platform raised about three inches from the floor. The sleeping compartment was covered over with wood so as to conserve the heat, and in the winter time sacks were hung in front of the compartment to ensure greater comfort for the sick pigs. This hospital has proved of very considerable value. Sick pigs are removed from the pens to the hospital as soon as symptoms appear. When recovery takes place the pigs are graded according to size and put back into the fattening pens. They are not mixed with the healthy pigs. Outbreaks of swine erysipelas have been easily controlled by the full use of the hospital. It has also been used for giving weaklings in a litter a better chance of looking after themselves and it has been found that many of these piglings which did not get a chance in life through suckling a poor teat developed into good pigs when isolated in this manner. The success of the hospital and the realisation that pigs appeared to do better in a warm, draught-free atmosphere decided the farmer to sheet up one of the fattening houses. This was done and proved so successful that it was decided to apply the same treatment to all the houses, the next house to be attended to being the rearing house. Later, when the evidence of maximum and minimum thermometer readings over a period showed that considerable variation in temperature in the rearing pens was still continuing, a boxed-in sleeping compartment was provided as in the hospital and sacks were hung down the front to protect the sow and litter completely from draughts. The sow and litter were obviously pleased with the new arrangement, for it was usual to find the sow lying inside the sleeping compartment with her snout appearing under the sack. The piglings would always sleep in the inner compartment and would come out into the outer pen to sport and play. Still later a small, low, covered-in box was built inside the inner sleeping compartment

for the greater comfort of the piglings. Rough estimates of the temperatures of these compartments would be about 60 degs. F. for the pen itself, about 70 degs. F. for the sleeping compartment for the sow, and about 80 degs. F. for the sleeping compartment for the piglings (see Table 2). As evidence that piglings appear to like warmth it was noticed that piglings very quickly made use of their own special compartment for sleeping. From the time of this isolation and warming up of the pig houses there was a marked drop in the number of necrotic enteritis and acute paratyphoid cases. Litter averages at weaning increased considerably and the pig population on the farm steadily increased. Although paratyphoid decreased the amount of pneumonia did not appear to lessen very appreciably after the reconstruction of the buildings. Late in 1938 a new fattening house was built incorporating all the improvements made to the existing buildings and so arranged as to economise as much as possible the work attached to the feeding of the pigs and the cleaning of the pens. This house proved so satisfactory that the other fattening houses on the farm were reconstructed on similar lines during 1939.

In February, 1939, Soluseptasine was used for a short time in the successful treatment of occasional outbreaks of acute arthritis in piglings up to 14 weeks old. So far as pneumonia was concerned, Soluseptasine did not appear to be of much value. In the following month M & B 693 was used for the first time and was found equally as successful in cases of acute arthritis as Soluseptasine, and since a maximum dose of six tablets effected a cure the difference in the cost led the farmer to use M & B 693 for preference. The use of M & B 693 in the treatment of pneumonia proved highly successful. At first large doses were used, e.g., nine tablets three times daily for adult fattening pigs. It was found, however, by experience that much smaller doses were quite satisfactory provided the case was attended to early, and it is quite common to find on the record card "one pig dosed with 693, three tablets," with the remark made next day, "pig recovered." So successful has been the use of M & B 693 that in spite of a large increase in the population the mortality has not only not increased, but has actually decreased considerably, e.g., the returns for the month of June, 1939, showed 92 deaths out of a population of 6,652 with 26 porkers which were slaughtered and salvaged. The returns for July were even better with a total of 61 deaths and nine porkers amongst a population of 6,802.

In August an additional step forward was made in an endeavour to cut losses still further by appointing one of the employees to a post which the farmer calls a "health inspector." It is this man's duty to visit all the pens on the farm several times daily, examine all the pigs and to report at once any evidence of disease.

During the past four years, when this farm has been under constant veterinary supervision by the staff at the Veterinary Research Division at Stormont, a number of experiments were carried out, some of which have already been mentioned. Others included a large-scale experiment on anæmia

in pigs by which it was definitely proved that it was essential to dose with iron piglings which are being housed all the time. It was noticed during the course of these experiments on anæmia that survivors of the non-iron group were much longer in fattening and that the losses in this group from paratyphoid and pneumonia occurred at an earlier age than in the iron group.

The treatment of milk fever in sows was carried out by the injection of calcium boro-gluconate with very successful results and it is now recognised that no sow should die from milk fever.

A febrile condition in sows which occurs at or immediately after farrowing at one time was responsible for considerable loss in both sows and litters. A typical case history is as follows: The sow would farrow normally but within three days of farrowing she would lose her appetite, the udder would become very hard and would appear to be congested with blood from the reddened appearance of the udder clinically. The milk would cease to flow from the teats and the piglings usually died from lack of milk unless they could be transferred to another sow. The temperature of the sow would rise as high as 108 degs. F. on occasion. At least 50 per cent. of the sows affected with the condition died. It was found that M & B 693 was almost a specific for this disease and it is now the regular practice on this pig farm to take the temperature of the sow morning, midday and night from the time the sow farrows until she is three days farrowed. Should the temperature rise to 104 degs. F. or more the sow is dosed with six tablets each time until the temperature becomes normal. This practice has been in operation for over four months now and appears to have successfully eliminated this source of loss. In addition, it has not been necessary to remove piglings from an affected sow, recovery taking place so quickly.

Periodically attacks of acute arthritis were responsible for quite serious losses amongst litters on the sow. The owner, on his own initiative, with a view to combating these attacks, decided to dose the piglings three times weekly with ½ tablet of M & B 693 until four or five weeks old. No cases of this disease have occurred during the four months that this practice has been in operation, although previously two or more cases occurred each month.

All this reorganisation and care for the health of the pigs has improved the litter numbers at weaning very considerably as is shown by Table 3. It is expected too that the number of pigs fattened per litter will show the same improvement. It is too early yet to give the figures.

Conclusions

From our experience on this pig farm we have formed the opinion that pigs require a much higher temperature in their pens than is generally provided. We are of the opinion that an optimum temperature for piglings up to eight weeks old is about 80 degs. F. and for pigs over that about 70 degs. F.

It would seem that by providing warmer and more comfortable surroundings paratyphoid has been almost completely eliminated, and that finally the

drug M & B 693 is of considerable value in the treatment of pneumonia in pigs, of acute arthritis in pigs, and of a febrile condition in sows shortly after farrowing.

TABLE 1

MORTALITY FIGURES

Date	Total Deaths*	Deaths per 100 of total population	Porkers	Porkers per 100 of total population	Total population
1936, January ...	150	4.3	49	1.4	3,485
„ April ...	273	8.3	68	2.1	3,290
„ July ...	118	3.6	21	.6	3,263
„ October ...	133	3.8	76	2.2	3,468
1937, January ...	166	4.5	59	1.6	3,688
„ April ...	166	4.7	48	1.4	3,549
„ July ...	149	3.6	49	1.2	4,166
„ October ...	160	3.8	40	.9	4,254
1938, January ...	253	5.8	37	.8	4,353
„ April ...	130	2.7	19	.4	4,810
„ July ...	145	2.8	37	.7	5,219
„ October ...	182	3.4	9	.2	5,403
1939, January ...	275	4.8	21	.4	5,674
„ April ...	150	2.4	18	.3	6,164
„ July ...	61	.9	9	.1	6,802

* On an average over these four years the farmer reckons that the "Deaths" column contains per month 40 pigs which he classifies as "Surplus" pigs. "Surplus" pigs are pigs which are born alive but die within the first few hours or days. These piglings are weaklings at birth and are usually from large litters. It is considered that this mortality is in no way connected with disease and that no means will ever be available to counteract this loss.

TABLE 2

TEMPERATURES OF HOUSES

Date	Farrowing House Day Min.	Farrowing House Day Max.	Farrowing House Night Min.	Farrowing House Night Max.	Fattening House Day Min.	Fattening House Day Max.	Fattening House Night Min.	Fattening House Night Max.	Hospital Day Min.	Hospital Day Max.	Hospital Night Min.	Hospital Night Max.
9/1/39 ...	59	61	55	60	61	64	60	62	62	66	61	65
	Inner boxes installed for piglings											
9/2/39 ...	72	79	72	79	75	76	75	78	71	73	67	74
9/3/39 ...	Pen empty				80	82	77	83	70	Not taken		77
*7/4/39 ...	70	76	65	74	68	82	75	81	67	74	69	79
†23/5/39 ...	74	76	72	74	72	74	74	76	72	75	75	78
9/6/39 ...	72	79	75	80	78	80	76	79	68	74	70	75
*10/7/39 ...	74	76	72	78	82	84	82	84	Pen empty			
9/8/39 ...	72	76	70	74	80	82	82	82	70	74	68	68
9/9/39 ...	74	76	72	80	82	82	78	82	70	70	68	74
9/10/39 ...	72	74	64	74	84	86	78	84	74	76	70	78
	Maximum variation in 24 hours 9 degs. F.				Maximum variation in 24 hours 14 degs. F.				Maximum variation in 24 hours 7 degs. F.			

* Temperatures were not taken on Sundays.

† Owing to illness amongst employees no temperature recordings were taken from April 14 till May 23.

TABLE 3

LITTER NUMBERS AT BIRTH AND WEANING

Year	No. of sows farrowed	Average litter No. at birth	Average litter No. at weaning
1936	560	10.5	8.5
1937	621	9.8	7.7
1938	809	9.75	7.8
1939 ... ... (7 months)	400	10.5	9.2

Clinical Articles

STONES IN THE STOMACH AND INTESTINES OF YOUNG PIGS

By RICHARD HUDSON, F.R.C.V.S.
Retford, Notts.

FOLLOWING the report of a suspected case of swine fever, an examination of the pigs on the farm was made.

Housing, sanitation and feeding were as bad as could be imagined. The diet consisted of raw whole potatoes fed in troughs, from which soil and stones had separated out and accumulated at the bottom.

Two pigs about three to four months old were dead and no symptoms had been observed, but among the living there was evidence of diarrhœa, unthriftiness and want of proper food.

The post-mortem examination showed a quantity of stones in the stomachs and intestines of both pigs and accumulations of sand. The stones varied in size from small pebbles to small hen eggs. Some were so large that I wondered how they could have been swallowed and passed through the outlet of the stomach.

The mucous membranes of the stomach and intestines were inflamed.

On a second examination a few days later, no stones were present but gastro enteritis, probably induced by sand, bad potatoes and filth bacteria from the floor.

The owner was advised to put them on to grass, scatter the potatoes about and feed them better. To give them dry meal. This soon brought about a general improvement in condition.

I have made many post-mortems on pigs, but I have not seen stones before. Why they should have eaten them is a mystery. Probably the potatoes were fed irregularly and the pigs, being hungry, had bolted them, but if so it was strange to find that no potatoes had been bolted. All appeared to have been masticated.

SWINE ERYSIPELAS

It is often very difficult to form a satisfactory diagnosis in some cases.

A big fat sow about a fortnight off farrowing was off her feed and had a rise of temperature of two degrees. She had been ill two or three days. I

could not find a spot on her in the place which was rather dark, but when she was turned out a typical spot was found behind her albow—one spot. If a big white sow can be ill with the disease and only show one spot in the course of it, surely many pigs can be ill without showing any.

Out of a lot of four fat pigs, one was found dead and two not very lively—tails down and off feed slightly.

The dead pig showed purple discoloration over abdomen, gastritis with slimy coating over mucous membrane, enteritis and congestion of the lungs. The spleen showed little alteration. Enlargement of the spleen is not as constant a feature of swine erysipelas as we are led to imagine, and I am inclined to think that its size is increased more by digestion than by the disease. Many pigs are found with a full stomach on P.M.E.

The three living pigs were injected with serum. Two days later the owner reported one of them showing typical diamond spots. The other ailing pig was still showing no rash.

Serum treatment was continued and both recovered. Here was an example of three types. One acute, death without warning; one typical rash; one ill without rash; one probably infected without symptoms.

Abstracts

THE SIMPLICITY OF THE DANISH-TYPE PIG HOUSE AND SOME POINTS ON ITS CONSTRUCTION

By JOHN R. G. CLOVER

*The Smallholder, July 15, 1939.

THE fame of Danish methods of pig-keeping and, in particular, their system of housing fatteners has reached far and wide, and resulted in widespread imitation.

The Danish-type fattening house is now a common sight on specialist pig farms and no doubt some smallholders have considered the practicability of themselves constructing a building of the kind.

The Danish-style pig-house looks a very simple affair—just a feeding passage, two rows of pig pens with their corresponding dunging alleys, a floor, walls, and roof.

But this simplicity is deceiving, for there are many small points which, if ignored, may mean regret after the pig house has been in use for a year or so.

* We are indebted to *The Smallholder* for permission to reproduce this article and also for the loan of the blocks.

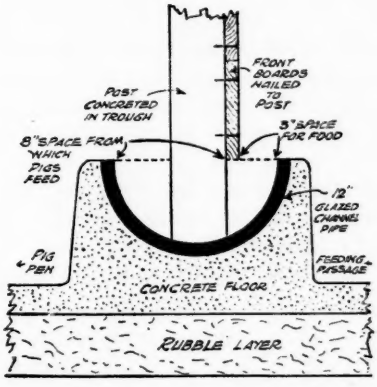
Also these points mean a saving in construction costs, and possibly a saving in labour later on.

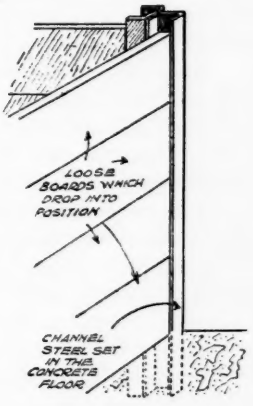
The floor may be of concrete, of bricks laid on the flat and grouted in position, or of the more expensive air bricks, specially designed for this type of work and fixed in the same way.

Use of Concrete for Flooring

If you want to use concrete, do not be put off by people who say it is cold. Properly laid, this material is perfectly warm; badly put down, it will lead to cramp and unthriftiness in the pigs.

It is, therefore, essential to use some form of insulation between the





concrete and the coldness of the ground. The most usual form is coke breeze or brick rubble. The latter is more suitable, while brick bats are even better than rubble.

Rubble is inclined to be rather too small, and when covered by concrete does not provide the cubic capacity of air space afforded by large brick bats. When you have put the rubble layer down, cover it with waterproof paper before you spread the concrete. This will prevent the wet, " runny " mixture seeping through into the rubble, and thus filling the valuable air spaces.

Saves Time Later

It is also advisable to mark or leave spaces for the posts which will come at the corners of the pens and entrances into the dunging passages, to save the later tedious job of cutting through hard concrete.

Give the floor plenty of time to dry. Put wet sacks over it to ensure its being kept damp during the drying process, for the chemical change taking place while hardening needs an extraordinary amount of water.

Ribbing the floor to prevent the pigs slipping is not necessary. If the pens are kept properly clean and dry, the surface of the concrete is sufficiently rough to prevent any trouble.

A good idea for fittings, sometimes used in Denmark, is to have corner-posts of channel steel, concreted in place, and to drop into place loose boards, the ends of which fit into the grooves on the posts as shown in the accompanying diagram. The advantage is that the walls may be easily removed for cleaning or replacement.

Corrugated iron is not advisable for pen partitions. It is cold, and pigs do not like lying up against anything which is not warm.

Whitewash is better than wood preservatives for "painting" the walls. Pigs may suffer from preservative poisoning, especially where they gnaw freshly coated wood.

Hinge the windows at the bottom, and arrange them to open inwards, dropping back into side cheeks. You can buy frames all ready to glaze, or you can make up ordinary wooden frames and tack some glass substitute on them. This type of window will give the desired ventilation so important to the well-doing of the pigs.

The troughs may be of glazed channel pipe or moulded concrete. The pipe is expensive but unbeatable. The twelve-inch type should be used.

Concrete is cheap, but not so durable. A trough of this material may be almost eaten away after a year's wear. The reason for this is not, as many people think, due to the pigs eating it—it is caused by acid from the food attacking it.

Trough-fronts may consist of spaced or solid boards, either swinging or fixed. If fixed, they may be vertical or sloping. The fixed fronts are better, for if you are short of space in the feeding passage, a sloping front will allow more room in which to work, and will not affect the pen's size.

Three inches on the feeding gangway side will allow sufficient room to put the food into the trough, while it will also provide eight inches on the other side of the front, from which the pigs feed.

Publishers' Notices

All communications should be addressed to 7 and 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Temple Bar 8568. Telegrams: "Baillière Phone, London."

Letters for the Journal, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Copy of advertisements should be in the hands of the publishers—Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than the 23rd.

Binding Cases for Volume 94 and any other previous volumes can be obtained from the publishers. Price 2s. 9d. post free.

Annual Subscription, 21s. ($5.00 U.S.A. currency), post free.